UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,515	04/07/2005	Takenobu Sunagawa	Q86666	5345

23373 7590 03/22/2007

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
BERNSHTEYN, MICHAEL	
ART UNIT	**PAPER NUMBER**
1713	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,515	SUNAGAWA ET AL.	
	Examiner	Art Unit	
	Michael Bernshteyn	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/26/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action follows a response filed on December 28, 2006. Claim 1-3 and 6-9 have been amended; no claims have been added or cancelled.

2. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

3. Claims 1-9 are pending.

Claim Rejections - 35 USC § 103

4. The text of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.

5. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable as obvious over Watanabe et al. (U. S. Patent 6,447,913) in view of Ding et al. (CN 1123302 A).

With regard to the limitations of claims 1-3 and 6-9, Watanabe discloses a thermoplastic polyester resin composition, wherein a thermoplastic polyester resin (A) is compounded with **1-25% by weight** (in the total composition) of impact resistance rendering materials (B), 0.1 to 15% by weight (in the total composition) of silicone compound and/or a fluorine compound (C), 1-50% by weight (in the total composition) of an inorganic filler (D), and 0.1-10% by weight of at least one polyfunctional compound (E) selected from the group consisting of an epoxy compound, an isocyanate compound and a carboxylic acid dianhydride. A molded article has anti-stress properties even in weld part thereof (abstract).

Examples of the polyester resin used as the component (A) are condensation polymerization products between a diol and a dicarboxylic acid such as **polyalkelene terephtalates** are preferably used, and **polybutylene terephtalates and copolymers** principally containing them are most preferably used. A mixture comprising two or more polyester resins mentioned above may be used (col. 3, lines 14-17).

Typical examples of impact resistance rendering materials (B) include thermoplastic elastomers and **core-shell polymers**. The thermoplastic elastomers is a generic term for polymeric substances, which is a solid exhibiting rubber-like elasticity at ordinary temperature but fusable with thermoplastic resins because the viscosity is reduced with an aid of heat. **Addition of the component B leads to decrease in the internal stress generated in the resin, which makes it possible to inhibit the development of cracks in alkaline solutions**. Accordingly, the component be is essential. The kinds of the thermoplastic elastomers are not particular limited and examples thereof include olefins, styrenes, polyesters, polyamides and urethanes (col. 3, lines 34-48). Of the olefin elastomers, **grafted copolymers** can be suitably used wherein ethylene/alkyl unsaturated carboxylate copolymers (a-1) or olefinic copolymers prepared by α-olefins and glycidyl ester of α,β -unsaturated acids (a-2) are chemically bonded with one or two or more of polymers or copolymers mainly composed by repeating units in the form of a branched or crosslinked structure (col. 3, lines 60-67).

Such **graft copolymers** have a particular effect of improving the resistance against alkaline solutions and particularly suitably used as the impact resistance rendering materials. Examples of the ethylene/alkyl unsaturated carboxylate copolymers

(a-1) include random copolymers such as ethylene/acrylic acid copolymers, ethylene/methacrylic acid copolymers, ethylene/acrylic acid/ethyl acrylate copolymers, ethylene/ethyl acrylate copolymers, ethylene/vinyl acetate copolymers and ethylene/ethyl acrylate/vinyl acetate copolymers, and furthermore, mixtures of these copolymers can be used (col. 4, lines 18-28).

α-Olefins, that are one side of monomers forming the olefin copolymers (a-2), include ethylene, propylene and butane-1, and ethylene is preferably used. The glycidyl esters of α,β -unsaturated acids that are the other side of the monomers forming the component (a-2) are compounds, which include glycidyl acrylate, glycidyl methacrylate and glycidyl ethacrylate, and in particular **glycidyl methacrylate** is preferred (col. 4, lines 29-38). The suitable composition of the segment (a-2) consists of 70 to 99% by weight of α-olefins and 30 to 1% by weight of glycidyl esters of α,β -unsaturated acids (col. 4 lines 49-51).

Polymers or copolymers (b) that are subject to **graft polymerization** with the olefin copolymers (a-1) or (a-2) are the following: poly(methyl methacrylate), poly(ethyl acrylate), poly(butyl acrylate), polystyrene, polyacrylonitrile, **acrylonitrile/styrene** copolymers, **butyl acrylate/ methyl methacrylate** copolymers and **butyl acrylate/styrene** copolymers (col. 4, lines 52-63).

Watanabe discloses that in the **graft copolymers** the olefin copolymers of the aforesaid (a-1) or (a-2) or polymers or copolymers of (b) are not to be separately used. The feature of graft copolymers is to have a branched or crosslinked structure where the copolymers (a-1) or (a-2) and the polymers or copolymers of (b) are chemically

bonded together at least at one point. **Such graft structure exerts a remarkable effect that cannot be attained by singly blending (a-1), (a-2) or (b)**. Herein, the **ratio** of (a-1) or (a-2) to (b) to compose the graft copolymers is suitably from **95:5 to 5:95** in weight (col. 4, line 66 through col. 5, line 10).

In the core-shell copolymers, vinyl polymers are used for the shell layer formed of the glassy resin. The vinyl polymers are obtained by the polymerization or copolymerization of at least one monomer selected from aromatic vinyl monomers, cyanided vinyl monomers, methacrylic ester monomers and acrylate ester monomers. In general, these rubber and shell layers of the core-shell copolymers are bonded through graft copolymerization. This graft copolymerization is carried out, if necessary, by adding a graft crosslinking agent reacting with the shell layer in the polymerization of rubber layer, providing reactive groups to the rubber layer, and allowing the shell layer to form (col. 7 line 57 through col. 8, line 2).

Watanabe discloses that a number average molecular weight of the epoxy group-containing ethylene-copolymer ranges from 5,000 to 600,000 and preferably from 10,000 to 500,000 and the distribution of molecular weight [ratio of the weight average molecular weight (Mw) to the number average molecular weight (Mn) (Mw/Mn)] is **10 or less**. The molecular structure of the block copolymers can be straight chain, branched chain or radical structures, or include all arbitrary combinations of these structures (col. 5, lines 46-54).

Thus, the weight average molecular weight of Watanabe would read on the claimed range because it only needs simple mathematical skill for one ordinary skilled in the art to calculate the weight average molecular weight of Watanabe.

Watanabe does not disclose that the composition does not contain α-olefins and that the viscosity modifier consists essentially of the units (a), (b) and (c).

Ding discloses the polymeric composition consisting essentially of the (a) 10-30% by weight of alkyl (meth) acrylate containing an epoxy group; (b) 40-70% by weight of another alkyl (meth) acrylate and (c) 10-40% by weight of another vinyl monomer copolymerizable therewith. This composition can be used as a viscosity modifier for acrylic and other resins (abstract). Weight average molecular weight of the viscosity modifier is 1,000-10,000, which is within the claimed range (page 1, claim 1).

Both references are analogous art because they are from the same field of endeavor concerning new polymerizable composition used as a viscosity modifier. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the viscosity modifier containing units of (a) (b) and (c) and having weight average molecular weight of 1,000 to 10,000 as taught by Ding in Ueno's thermoplastic polyester resin composition because the usage of such viscosity modifier is simple for the preparation, product cost is low, properties of the final resin are stable and raw materials are easily available (CN'302, abstract, page 1, 3rd paragraph), and thus to arrive at the subject matter of instant claims 1-3 and 6-9.

With regard to the limitations of claims 4 and 5, Watanabe discloses that the compositions can be applied to various processes for molding and formed into various

molded articles. That is, the compositions are suitably applied not only to injection molding (insert molding) but also to extrusion molding, blow molding (various hollow articles), vacuum forming and compression molding. They are in particular suitable for molded products having any one of a metal insert, a press-fit member and a screwed part, or a weld part, the molded article being used in places, contacting with water, alkali, etc. under stress (col. 11, lines 51-60). The compositions and molded articles have very excellent long-term durability to alkaline solutions and can be suitably used in a wide variety of the fields such as electric, electronic, automobile and general merchandise fields (col. 12, lines 23-27).

Thus, the combination of Watanabe and Ding renders all instant claims *prima facie* obvious in view of absent of unexpected results commensurate in scope of claims.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael Bernshteyn
Patent Examiner
Art Unit 1713

MB
03/16/2007

DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700